REMARKS/ARGUMENTS

1. In the above referenced Office Action, the Examiner rejected claims 1, 3, 4, 9, 10, 13, 15, 16, 17, 21, 22, 27, 28, 29, 33, 36, and 37 under 35 USC § 103 (a) as being unpatentable over Petty (U.S. Patent No. 5,187,722) in view of Fan (U.S. Patent Application No. 2002/0121938); and claims 2, 8, 35, and 41 under 35 USC § 103 (a) as being unpatentable over Petty (U.S. Patent No. 5,187,722) in view of Fan (U.S. Patent Application No. 2002/0121938) in further view of Irwin (U.S. Patent No.5,774,023). In addition, the Examiner has objected to claims 5-7, 11, 12, 14, 18-20, 23-26, 30-32, 34, and 38-40 as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The rejections and objections have been traversed and, as such, the applicant respectfully requests reconsideration of the allowability of claims 1-41.

2. Claims 1, 3, 4, 9, 10, 13, 15, 16, 17, 21, 22, 27, 28, 29, 33, 36, and 37 have been rejected under 35 USC § 103 (a) as being unpatentable over Petty (U.S. Patent No. 5,187,722) in view of Fan (U.S. Patent Application No. 2002/0121938). The applicant respectfully disagrees with this rejection and the reasoning thereof.

Petty teaches a simple phase locked loop that includes a fractional multiple divider 410 (M/N) in the feedback path to obtain the desired output oscillation ($f_{out}=(M/N)*f_{in}$ of Figure 4) from the input oscillation. Petty does not teach or suggest a configurable feedback path consisting of first and second feedback paths.

Fan teaches a sigma delta based fractional-N frequency synthesizer which uses a divider value of N or N+0.5 over time to produce a desired divider value between N and N+0.5 and uses a divider of N+0.5 or N+1 over time to produce a desired divider value between N+0.5 and N+1. (paragraph 22) Fan teaches that a convention sigma delta based fractional-N frequency synthesizer uses N or N+1 as the divider to produce the desired divider value. In a specific example, Fan teaches in paragraph 6 that if the dividing ratio is alternately N for three periods, then N+1 for one period, then N for three periods, etc., the output frequency will be (N+0.25) times the input frequency.

The prior art of the present patent application discloses fractional-N frequency synthesizer on page 3, line 30, through page 4, line 16, by stating:

> To select a particular divider value, the PLL includes a Sigma Delta modulator, which generates a digital signal that represents the fractional portion. For example, to generate a 2484 MHz local oscillation from a 20 MHz reference frequency, a divider value of 124.4 is needed. As such, the digital signal produced by the Sigma Delta modulator causes the adjustable divider feedback to jump between a 1st value (e.g., 124) and a 2nd value (e.g., 125) such that an average of 124.4 is obtained.
>
> An issue arises with such Sigma Delta modulator circuits when the divider value is near an integer value (i.e., the fractional value is very small, e.g., 0.03 or less or is very large, e.g., 0.97 or greater). When this is the case, the Sigma Delta modulator produces very little modulation, which causes the PLL to generate fractional spurs. Such fractional spurs adversely affect the local oscillator and hence adversely affect the radio receiver and/or radio transmitter.

Thus, a sigma delta based fractional-N frequency synthesizer as taught by Fan and as disclosed in the background section of the present invention, uses a single divider path alternating between one of two divider values to obtain, over time, a desired divider ratio.

The fractional-N synthesizer of the present invention includes two feedback paths to facilitate the generation of a desired divider value. As such, the combined teachings of Petty and Fan do not render the present claims obvious.

3. Claims 2, 8, 35, and 41 have been rejected under 35 USC § 103 (a) as being unpatentable over Petty (U.S. Patent No. 5,187,722) in view of Fan (U.S. Patent Application No. 2002/0121938) in further view of Irwin (U.S. Patent No.5,774,023). The applicant respectfully disagrees with this rejection and the reasoning thereof.

Since, as demonstrated above, the independent claims are not obvious in view of Petty and Fan, the further combination of Irwin with Petty and Fan does not render the present claims obvious.

For the foregoing reasons, the applicant believes that claims 1-41 are in condition for allowance and respectfully request that they be passed to allowance.

The Examiner is invited to contact the undersigned by telephone or facsimile if the Examiner believes that such a communication would advance the prosecution of the present invention.

RESPECTFULLY SUBMITTED,

By: /Timothy W. Markison reg. 33,534/
Timothy W. Markison
Phone: (808) 665-1725
Fax No. (808) 665-1728

CERTIFICATE OF FACSIMILE

I hereby certify that this correspondence is being transmitted by Facsimile to United States Patent & Trademark Office, facsimile number (571) 273-8300 on the date below:

09/08/2006
Date

Signature